

10009704

FILE 'CAPLUS' ENTERED AT 18:47:55 ON 23 SEP 2003

L5 3434 (CRYOGENIC OR SUPERFLUID OR SUPERCRITICAL) (S)  
(ABSORPTION OR SPECTRO?)

L6 0 L5 AND IMPURIT

L7 88 L5 AND IMPURIT?

L7 ANSWER 1 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Rapid method development for chiral separation in drug discovery using sample pooling and supercritical fluid chromatography-mass spectrometry

L7 ANSWER 2 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Microscopic superfluidity of small 4He and para-H<sub>2</sub> clusters inside helium droplets

L7 ANSWER 3 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Advancing NMR Sensitivity for LC-NMR-MS Using a Cryoflow Probe: Application to the Analysis of Acetaminophen Metabolites in Urine

L7 ANSWER 4 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Supercritical fluid extraction for the detection of 2-dodecylcyclobutanone in low dose irradiated plant foods

L7 ANSWER 5 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Testing of superfluid-cooled 920 MHz NMR cryostat

L7 ANSWER 6 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Detector signal relaxations and their correction: the Si:Ga bulk detectors of the CRISTA instrument

L7 ANSWER 7 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Application of density-functional theory to line broadening: Cs atoms in liquid helium

L7 ANSWER 8 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Synthesis and thermal decomposition of nitrate-free boehmite nanocrystals by supercritical hydrothermal conditions

L7 ANSWER 9 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Single and double infrared transitions in rapid-vapor-deposited parahydrogen solids: application to sample thickness determination and quantitative infrared absorption spectroscopy

L7 ANSWER 10 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Structural studies of impurity-helium solids

L7 ANSWER 11 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Application of density functional theory to line broadening: Cs atoms in liquid helium

L7 ANSWER 12 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Local spectroscopy of a Kondo impurity: Co on Au(111)

L7 ANSWER 13 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI CO/pH<sub>2</sub>: a molecular thermometer

L7 ANSWER 14 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Natural products characterization: Analysis of mass-limited samples using 3-mm microCryoProbe

L7 ANSWER 15 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Progress of fusion fuel processing system development at the Japan Atomic Energy Research Institute

L7 ANSWER 16 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Method and system for detecting trace materials in cryogenic liquids

L7 ANSWER 17 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Dimerization of  $^3\text{He}$  in  $^3\text{He}$ - $^4\text{He}$  dilute mixtures filling narrow channels

L7 ANSWER 18 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Injection level lifetime spectroscopy of impurities in semiconductors

L7 ANSWER 19 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Solvation structure of impurity molecules in supercritical fluids studied by photoconductivity measurement and X-ray absorption fine structure (XAFS) spectroscopy

L7 ANSWER 20 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Sample purification for spectroscopic high-pressure investigations by dynamic supercritical fluid extraction

L7 ANSWER 21 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Potential interferences generated during mercury species determination using acid leaching, aqueous ethylation, cryogenic gas chromatography and atomic spectrometry detection techniques

L7 ANSWER 22 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Pairing in Fermi fluids in restricted geometries

L7 ANSWER 23 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Optical spectra of atoms in liquid helium and cold helium gas

L7 ANSWER 24 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Ortho/para hydrogen converter for rapid deposition matrix isolation spectroscopy

L7 ANSWER 25 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Illuminating single molecules in condensed matter

L7 ANSWER 26 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Pairing in Fermi fluids in restricted geometries

L7 ANSWER 27 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Hydrogen exchange reactions in supercritical media monitored by in situ NMR

L7 ANSWER 28 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Tunneling into magnetic atoms: Local spectroscopy of Kondo impurities.

L7 ANSWER 29 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Ions and atoms in superfluid  $^4\text{He}$ : motion studies and optical transitions

L7 ANSWER 30 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI ESR spectroscopy of  $\text{N}(^4\text{S})$  atoms trapped in superfluid helium

L7 ANSWER 31 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Spectroscopic study of atoms and molecules in liquid helium

L7 ANSWER 32 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI High-pressure investigations on the solubility of synthetic and natural dyestuffs in supercritical gases by VIS-spectroscopy up to 180 MPa

L7 ANSWER 33 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Nuclear spin polarization in heavy-ion reactions

L7 ANSWER 34 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Optical spectroscopy of atoms in superfluid helium  
 L7 ANSWER 35 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Laser spectroscopy of impurity atoms in superfluid helium  
 L7 ANSWER 36 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Poly(vinyl chloride) and vinyl chloride copolymer powders suitable for use in PVC pastes, removal of auxiliary compounds from the powders, and use of the powders  
 L7 ANSWER 37 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Interaction between charge carriers and foreign atoms in superfluid helium. From bound states to unusual transport  
 L7 ANSWER 38 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI SFC/NMR online coupling  
 L7 ANSWER 39 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI A new process for the production of high purity carbon monoxide and hydrogen  
 L7 ANSWER 40 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Investigation of impurities in superfluid helium by optical spectroscopy  
 L7 ANSWER 41 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Preparation, structural properties, and hydrogenation activity of highly porous palladium-titania aerogels  
 L7 ANSWER 42 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI High surface area platinum-titania aerogels: preparation, structural properties, and hydrogenation activity  
 L7 ANSWER 43 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Determination of trace amounts of impurities in molybdenum by spark source and glow discharge mass spectrometry  
 L7 ANSWER 44 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI IR spectroscopy and analysis of the impurity composition of individual xenon fluorides in liquid noble gas solutions  
 L7 ANSWER 45 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Semi-self-maintained glow discharge in a mixture carbon monoxide and nitrogen at cryogenic temperatures  
 L7 ANSWER 46 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Consideration of the chemical reactivity of trace impurities present in a glow discharge  
 L7 ANSWER 47 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Spectroscopy of alkali atoms and molecules in superfluid helium  
 L7 ANSWER 48 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Vibrational spectra of phosphine of various degrees of purity in a solution of liquid argon  
 L7 ANSWER 49 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Cryogenic coil for glow discharge sources  
 L7 ANSWER 50 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Solar magnetic field studies using the 12 micron emission lines. II. Stokes profiles and vector field samples in sunspots  
 L7 ANSWER 51 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

TI Monitoring of dopant and impurity concentrations in liquid argon by infrared spectroscopy

L7 ANSWER 52 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Dye laser spectroscopy of isolated atoms and ions in liquid helium

L7 ANSWER 53 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Isotopic spectral analysis of inorganic gases

L7 ANSWER 54 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Application of a cryospectroscopy method to study the molecular composition of gases

L7 ANSWER 55 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Steam reforming of hydrocarbons for producing hydrogen and carbon monoxide

L7 ANSWER 56 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Very low temperature cathodeluminescence analyzer

L7 ANSWER 57 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Method and apparatus for the purification of nitrogen in cryogenic air separation

L7 ANSWER 58 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI in situ Moessbauer spectroscopy of a species irreversibly adsorbed on an electrode surface

L7 ANSWER 59 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Krypton removal from the dissolver offgas with the solvent R-12

L7 ANSWER 60 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Reconditioning of semiconductor detectors

L7 ANSWER 61 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Isotopic-chromatographic-spectral analysis of high-purity inorganic gases

L7 ANSWER 62 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Vibrational spectra of liquid high-purity silicon, germanium, sulfur, and selenium hydrides and their solutions in liquid krypton

L7 ANSWER 63 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Absorption spectra of silicon irradiated with reactor neutrons at cryogenic temperatures

L7 ANSWER 64 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Solar magnetic field studies using the 12 micron emission lines. I. Quiet Sun time series and sunspot slices

L7 ANSWER 65 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Process and apparatus to produce ultra-high-purity oxygen from a gaseous feed

L7 ANSWER 66 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI The kinetics of phonon-impurity system of superfluid helium-3-helium-4 solutions

L7 ANSWER 67 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Helium-filled proportional counter for low-temperature operation (4.2-300 K) and its application to cryogenic resonance-electron Moessbauer spectroscopy

L7 ANSWER 68 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Transport efficiency of free atoms for laser spectroscopy using a cryogenic helium jet

L7 ANSWER 69 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Application of low temperature desorption in systems for adsorptive purification of cryogenic gases

L7 ANSWER 70 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Phonon and impurity absorption of sound in dilute helium-3/helium-4 solutions below 0.5 K

L7 ANSWER 71 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Adsorption methods for the purification of air and the products of air fractionation  
 L7 ANSWER 72 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Composition of residual gases in laboratory metallurgical apparatus with cryogenic pumping  
 L7 ANSWER 73 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Spectroscopic studies of pyrazine in cryogenic solutions  
 L7 ANSWER 74 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Spectroscopic studies of pyrazine in cryogenic solutions  
 L7 ANSWER 75 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Cryogenic techniques in infrared spectroscopy  
 L7 ANSWER 76 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI Feasibility studies on exhaust plasma processes  
 L7 ANSWER 77 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 TI FFTF sodium and cover-gas chemistry

=> d 17 ibib abs 10, 13, 16-21, 25, 28, 30-35, 37-40, 43-49, 51-54, 62, 66-71, 73-75

L7 ANSWER 10 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2001:928857 CAPLUS  
 DOCUMENT NUMBER: 136:268555  
 TITLE: Structural studies of impurity-helium solids  
 AUTHOR(S): Kiselev, S. I.; Khmelenko, V. V.; Lee, D. M.; Kiryukhin, V.; Boltnev, R. E.; Gordon, E. B.; Keimer, B.  
 CORPORATE SOURCE: Laboratory of Atomic and Solid State Physics, Cornell University, Ithaca, NY, 14853-2501, USA  
 SOURCE: Physical Review B: Condensed Matter and Materials Physics (2002), 65(2), 024517/1-024517/12  
 CODEN: PRBMDO; ISSN: 0163-1829  
 PUBLISHER: American Physical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB We have used x-ray diffraction and ultrasound techniques to study the structure of mesoporous impurity-He solids created after the injection of impurity particles (D2, Ne, N2, Kr) into a vol. of superfluid 4He. Clusters of impurities with size of order 50 +/- 20 .ANG. and d. apprx. 1020 impurities/cm3 were obsd. by x-ray diffraction. The presence of a wide distribution of pore sizes in Im-He solids was revealed by ultrasound (80 to 8600 .ANG.) and by small-angle x-ray scattering (80 to >400 .ANG.). Both x-ray and ultrasound methods detected irreversible structural changes when samples were warmed above T.lambda. = 2.17 K. This is ascribed to the aggregation of small clusters caused by thermally activated diffusion. In addn. to being of fundamental interest, the properties of the unique porous media studied in this work may be relevant to investigations of low temp. chem. reactions, storage of free radicals, matrix isolation spectroscopy , and superfluid 4He contained in the pores of an extremely compliant medium.  
 REFERENCE COUNT: 38

L7 ANSWER 13 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 2001:317187 CAPLUS  
DOCUMENT NUMBER: 134:316805  
TITLE: CO/pH<sub>2</sub>: a molecular thermometer  
AUTHOR(S): Tam, Simon; Fajardo, Mario E.  
CORPORATE SOURCE: US Air Force Research Laboratory, AFRL/PRSP,  
Propulsion Directorate, Edwards AFB, CA, 93524-7680, USA  
SOURCE: Journal of Low Temperature Physics (2001), 122(3/4), 345-357  
CODEN: JLTPAC; ISSN: 0022-2291  
PUBLISHER: Kluwer Academic/Plenum Publishers  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB We utilize reversible temp. dependent changes in the IR absorption spectrum of CO mols. isolated in solid para-hydrogen (pH<sub>2</sub>) to probe bulk temp. changes during rapid vapor deposition. The intensity of a well resolved feature near 2135 cm<sup>-1</sup> increases monotonically with temp. over the 2 to 5 K range. The thermally populated initial state of this transition lies .apprx. 12 K above the CO/pH<sub>2</sub> ground state. During the deposition of .apprx. 100 ppm CO/pH<sub>2</sub> samples, we detect temp. gradients .apprx. 10 K/cm in .apprx. 0.1 cm-thick samples subjected to heat loads .apprx. 10 mW/cm<sup>2</sup>. The resulting estd. thermal cond. (TC) is 3(+.2) mW/cm-K, averaged over the 2 to 5 K region. This value is .apprx. 1000 times lower than the TC of single crystal solid pH<sub>2</sub>, and .apprx. 10 times lower than previously measured for pH<sub>2</sub> solids doped with 100 ppm concns. of heavy impurities. We attribute this abnormally low TC to the known mixed fcc/hcp structure of the rapid vapor deposited solids.

REFERENCE COUNT: 44

L7 ANSWER 16 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 2000:790718 CAPLUS  
DOCUMENT NUMBER: 133:328939  
TITLE: *Method and system for detecting trace materials in cryogenic liquids*  
INVENTOR(S): Walker, Dwight Sherod; Mascho, John Anderson Jr.  
PATENT ASSIGNEE(S): Glaxo Group Limited, UK  
SOURCE: PCT Int. Appl., 26 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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WO 2000067000 A1 20001109 WO 2000-US11418 20000428  
EP 1177425 A1 20020206 EP 2000-926451 20000428  
JP 2002543419 T2 20021217 JP 2000-615589 20000428  
PRIORITY APPLN. INFO.: US 1999-132042P A2 19990430  
WO 2000-US11418 W 20000428

AB A method for qual. and quant. detn. of trace impurities in a cryogenic liq., comprising the steps of (i) measuring the absorption spectrum of the cryogenic liq. by

passing light in the IR region through the cryogenic liq., the cryogenic liq. absorption spectrum having a 1st ref. energy, (ii) measuring the absorption spectrum of at least one impurity alone by passing light in the IR region through the impurity, (iii) passing a cryogenic liq. sample into a flow cell, wherein the max. pressure drop of the cryogenic liq. sample across said flow cell is at 0.5-5.0 lb./in.2, (iv) measuring the absorption spectra of the cryogenic liq. sample by passing light in the IR region through the cryogenic liq. sample while the cryogenic liq. sample is within the cell, (v) comparing the cryogenic liq. sample absorption spectra to the cryogenic liq. and impurity spectra, (vi) confirming the presence of the sample absorption spectrum assocd. with the impurity, the sample absorption spectrum assocd. with the impurity having a 2nd ref. energy, and (vii) detg. the concn. (C) of the impurity in the cryogenic liq. sample by the following relation,  $kC = \log 2\text{nd ref. energy}/\text{first ref. energy}$  where k is a fixed proportionality const.

REFERENCE COUNT: 4

L7 ANSWER 17 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2000:629698 CAPLUS

DOCUMENT NUMBER: 133:256993

TITLE: Dimerization of  $^3\text{He}$  in  $^3\text{He}$ - $^4\text{He}$  dilute mixtures filling narrow channels

AUTHOR(S): Bashkin, Eugene P.; Wojdylo, John

CORPORATE SOURCE: Department of Physics, The University of Western Australia, Kenwick, 6107, Australia

SOURCE: Physical Review B: Condensed Matter and Materials Physics (2000), 62(10), 6614-6628

CODEN: PRBMDO; ISSN: 0163-1829

PUBLISHER: American Physical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB We consider dimerization of  $^3\text{He}$  in a dil. soln. of  $^3\text{He}$  in superfluid  $^4\text{He}$  filling straight narrow channels that can be found in nanoscale porous media. Dimer formation is facilitated by the restricted geometry and occurs despite the fact that in bulk fluid the interparticle interaction is too weak to lead to a bound state. Dimerization results in the effective "bosonization" of the system: a Bose quantum fluid of  $(^3\text{He})_2$  arises in place of the  $^3\text{He}$  Fermi component. At high temps., when the  $^3\text{He}$  impurity quasiparticles form a Maxwell-Boltzmann gas, a drastic change in the thermodyn. occurs due to the presence of dimers. The sp. heat and magnetic susceptibility of the  $^3\text{He}$  component, which we calc. at arbitrary degrees of dimerization, show a marked deviation from behavior expected of an un-dimerized  $^3\text{He}$  component. We show that the binding energy - which depends on the channel width - is expected to be sufficiently high to make exptl. observation feasible. The presence of  $(^3\text{He})_2$  dimers gives rise to an extra absorption mechanism for first sound propagating through the superfluid  $^4\text{He}$ , due to resonant absorption and decay of dimers in the acoustic field. We have calcd. the absorption coeff. Several expts. suggest themselves, utilizing, perhaps, K-L zeolites or carbon nanotubes. If the dimers themselves turn out to be attractive, then quadrumers may appear: it may even be the case that a single  $^3\text{He}$  polymer will form over the entire length of the channel.

REFERENCE COUNT: 50

L7 ANSWER 18 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2000:275791 CAPLUS

DOCUMENT NUMBER: 132:301496

TITLE: Injection level lifetime spectroscopy of impurities in semiconductors

AUTHOR(S): Ahrenkiel, R. K.; Keyes, B. M.; Johnston, S.

CORPORATE SOURCE: National Renewable Energy Laboratory, Golden, CO, 80401, USA

SOURCE: Surface Engineering (2000), 16(1), 54-60

CODEN: SUENET; ISSN: 0267-0844

PUBLISHER: IOM Communications Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The identification of semiconductor defects is a major task in photovoltaic and most solid state electronic technologies. A variety of techniques are used in materials anal. and many were extensively described in the literature. Esp. desirable are non-contact techniques that are sensitive to impurities in metals. Photoluminescence spectroscopy comes close to meeting this need, however it usually requires cryogenic cooling of the test specimen. The present authors have found that techniques based on measurement of recombination lifetime over a wide range of injection levels can be powerful and sensitive for materials characterization. Not only is recombination lifetime sensitive to chem. and structural defects, but when a single defect dominates the recombination process that defect can be identified by observing the details of excess carrier decay over several orders of magnitude. This method of defect characterization and identification will be the focus of this paper.

REFERENCE COUNT: 28

L7 ANSWER 19 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2000:90838 CAPLUS

DOCUMENT NUMBER: 132:199340

TITLE: "Solvation structure of impurity molecules in supercritical fluids studied by photoconductivity measurement and X-ray absorption fine structure (XAFS) spectroscopy"

AUTHOR(S): *Nakagawa, Kazumichi; Murata, Takatoshi*

CORPORATE SOURCE: Faculty of Human Development, Kobe University, Kobe, 657-8501, Japan

SOURCE: **Proceedings of the IEEE International Conference on Dielectric Liquids, (ICDL '99), 13th, Nara, Japan, July 20-25, 1999 (1999), 108-109. Institute of Electrical and Electronics Engineers: New York, N. Y.**

CODEN: 68QJAZ

DOCUMENT TYPE: Conference

LANGUAGE: English

AB Solvation structure of anthracene mol. and bromonaphthalene mol. doped in supercrit. xenon fluids was studied on the basis of photocond. spectroscopy and X-ray absorption spectroscopy. It was concluded that values of ionization potential derived from photocond. measurement were sensitive for the assocn. of xenon atoms onto the benzene rings of anthracene mol. Results from the X-ray absorption near-edge structures



(XANES) spectra of bromonaphthalene in supercrit. xenon, local assocn. of xenon atoms surrounding Br atom were detected with high sensitivity.

REFERENCE COUNT: 5

L7 ANSWER 20 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1999:707245 CAPLUS

DOCUMENT NUMBER: 132:36951

TITLE: Sample purification for spectroscopic high-pressure investigations by dynamic supercritical fluid extraction

AUTHOR(S): Wagner, Bjorn; Nishioka, Mamoru; Tuma, Dirk; Maiwald, Michael; Schneider, Gerhard M.

CORPORATE SOURCE: Physikalische Chemie, Fakultat für Chemie, Ruhr-Universität Bochum, Bochum, D-44780, Germany

SOURCE: Journal of Supercritical Fluids (1999), 16(2), 157-165

CODEN: JSFLEH; ISSN: 0896-8446

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A method for the high resolu. purifn. of 1,4-bis(n-alkylamino)-9,10- anthraquinone dye samples based on a modified supercrit. fluid chromatog. equipment was developed to minimize errors in high-pressure soly. measurements. Impurities and byproducts were eluted in a continuous CO<sub>2</sub> flow and the purifn. process could be obsd. by a diode array spectrophotometer. The fact that both static and dynamic soly. expts. of a selected dye gave consistent results turned out to be a credit point for this new method, which can be universally used for other purifications, too. The necessity of calibrating directly in the solvent gas is demonstrated, since some org. solvents lead to characteristic spectral effects which can strongly disagree with those in CO<sub>2</sub>. Our expts. showed a weakening of these effects towards longer alkyl chains of this substance class. In a sep. section, some remarks are given concerning the use of wavenumbers instead of wavelengths in such expts.

REFERENCE COUNT: 20

L7 ANSWER 21 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1999:486745 CAPLUS

DOCUMENT NUMBER: 131:124630

TITLE: Potential interferences generated during mercury species determination using acid leaching, aqueous ethylation, cryogenic gas chromatography and atomic spectrometry detection techniques

AUTHOR(S): Tseng, C. M.; De Diego, A.; Wasserman, J. C.; Amouroux, D.; Donard, O. F. X.

CORPORATE SOURCE: Laboratoire de Chimie Bio-Inorganique et Environnement  
- EP CNRS 132, Université de Pau et des Pays de  
l'Adour, Pau, 64000, Fr.

SOURCE: Chemosphere (1999), 39(7), 1119-1136

CODEN: CMSHAF; ISSN: 0045-6535

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A careful search for formation of methylmercury (MeHg<sup>+</sup>) as an artifact and for potential interferences has been carried out using an anal. procedure involving aq. phase ethylation, cryogenic trapping, low temp. gas chromatog. and quartz furnace at. absorption spectrometry (Eth-CT-GC-QFAAS) for mercury speciation, after open-focused microwave extn. The results show that spurious MeHg<sup>+</sup> formation from Hg<sup>2+</sup> can occur mainly in the chromatog. column during the detn. step rather than during the extn. step. The agent, dimethyldisilazane, acting as a Me donor, appears to be responsible for the EtMeHg formation when high concns. of Hg<sup>2+</sup> (>1 ppm) are present in the soln. during the anal. On the other hand, the prodn. of several unknown peaks, closely corresponding to Me<sub>2</sub>Hg, Et<sub>2</sub>Hg etc. in the chromatogram, is the result of impurities in the derivatizing agent, NaBEt<sub>4</sub>. The magnitude of these interferences varies with different lots of reagent. The derivatization and detn. steps must always be checked following std. QA/QC procedures. Once interference problems are taken into account, reliable understanding of Hg cycling and behavior in aquatic environments will be achieved.

REFERENCE COUNT: 14

L7 ANSWER 25 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1999:190364 CAPLUS

DOCUMENT NUMBER: 130:288469

TITLE: "Illuminating single molecules in condensed matter"

AUTHOR(S): *Moerner, W. E.; Orrit, Michel*

CORPORATE SOURCE: Department of Chemistry, Stanford University,  
Stanford, CA, 94305-5080, USA

SOURCE: **Science (Washington, D. C.) (1999), 283(5408), 1670-1676**

CODEN: SCIEAS; ISSN: 0036-8075

PUBLISHER: American Association for the Advancement of Science

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review, with 76 refs. Efficient collection and detection of fluorescence coupled with careful minimization of background from impurities and Raman scattering now enable routine optical microscopy and study of single mols. in complex condensed matter environments. This ultimate method for unraveling ensemble avs. leads to the observation of new effects and to direct measurements of stochastic fluctuations. Expts. at cryogenic temps. open new directions in mol. spectroscopy, quantum optics, and solid-state dynamics. Room-temp. studies apply several techniques (polarization microscopy, single-mol. imaging, emission time dependence, energy transfer, Lifetime studies, and the Like) to a growing array of biophys. problems where new insight may be gained from direct observations of hidden static and dynamic inhomogeneity.

REFERENCE COUNT: 92

L7 ANSWER 28 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1998:529096 CAPLUS

TITLE: Tunneling into magnetic atoms: Local spectroscopy of Kondo impurities.

AUTHOR(S): Crommie, Michael F.; Madhavan, Vidya; Chen, Wei; Jamneala, Tiberiu  
CORPORATE SOURCE: Department Physics, Boston University, Boston, MA,  
02215, USA

SOURCE: Book of Abstracts, 216th ACS National Meeting, Boston, August 23-27  
(1998), INOR-264. American Chemical Society: Washington, D. C.

CODEN: 66KYA2

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB The Kondo effect arises from an exchange interaction between the conduction electrons of a host metal and a magnetic impurity, and is predicted to result in local charge and spin variations around the magnetic impurity. We have used a cryogenic scanning tunneling microscope (STM) to perform spectroscopic measurements of the electronic structure of individual Kondo impurities on a gold surface. Cobalt atoms were deposited onto a Au(111) surface at low temp. (4K) to provide a source of isolated magnetic impurities. STM spectroscopy performed on individual cobalt atoms reveals an energetically narrow feature that is identified as the Kondo resonance, the excitation spectrum of a single Kondo impurity. The lineshape of the Kondo resonance is not Lorentzian, but rather has the asym. shape that is characteristic of a Fano resonance. This is explained using a modified Fano theory that includes Coulomb interactions at the site of the impurity. Using at. manipulation, we have also studied interaction effects between two Kondo impurities by monitoring changes in the Kondo resonance as a function of inter- impurity spacing.

L7 ANSWER 30 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:642946 CAPLUS

DOCUMENT NUMBER: 127:340796

TITLE: "ESR spectroscopy of N(4S) atoms trapped in superfluid helium"

AUTHOR(S): Popov, E. A.; Boltnev, R. E.; Gordon, E. B.; Khmelenko, V. V.;  
Martynenko, M. V.; Pelmenev, A. A.; Shidov, E. V.

CORPORATE SOURCE: Institute for Energy Problems of Chemical Physics,  
Chernogolovka, 142432, Russia

SOURCE: International Conference on Low Temperature Chemistry, 2nd,  
Kansas City, Mo., Aug. 4-9, 1996 (1996), 145-146. Editor(s): Durig, James R.;  
Klabunde, Kenneth J. BkMk Press: Kansas City, Mo.

CODEN: 65DLAN

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The title spectra, obtained at 1.7 K in nitrogen-helium as well as rare gas-helium slurry (impurity helium solid phase, IHSP), presents a broadened triplet centered at  $g \approx 2.0$ . Anal. of the spectral line shape and width in nitrogen-helium IHSP showed that N(4S) atoms are stabilized in concns. as high as  $n \approx 1020/\text{cc}$ ; satellites in the ESR indicated the presence of microcryst. nitrogen. ESR of nitrogen atoms in isolated in neon-helium IHSP in concns.  $n=1015/\text{cc}$  comprised triplets with peak to peak linewidth  $\Delta H_{pp} = 1.2\text{G}$ .  $g_N = 2.0019(8)$  and hyperfine splitting const.  $A_N = 11.5\text{-}11.8\text{ MHz}$ . The results indicate that the nitrogen atoms are surrounded mainly by helium atoms and the spectra obsd. originate from imperfections in IHSP, where the

environment is anisotropic and the nearest neighbor , rare gas or N<sub>2</sub> mol., has to be adjacent He atoms.

L7 ANSWER 31 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:145837 CAPLUS

DOCUMENT NUMBER: 126:244112

TITLE: "Spectroscopic study of atoms and molecules in liquid helium"

AUTHOR(S): *Takami, M.*

CORPORATE SOURCE: Inorganic Chemical Physics Laboratory, The Institute of Physical and Chemical Research (RIKEN), Saitama, 351-01, Japan

SOURCE: **Comments on Atomic and Molecular Physics (1996), 32(4), 219-231**

CODEN: CAMPBS; ISSN: 0010-2687

PUBLISHER: Gordon & Breach

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB Neutral atoms in liq. He are known to reside in a bubble-like cavity due to a repulsive force with the surrounding He atoms. Phys. properties of such atoms (and mols.) are currently studied by laser spectroscopy , revealing the exotic behavior of impurity particles in superfluid He. The existence of a bubble significantly affects the at. spectra, but in a different way in the low and high excited states of the valence electrons. An optical pumping expt. demonstrates that radiofrequency transitions among Zeeman sublevels have frequencies close to the free space values, while the hyperfine transition obsd. in Cs shows a clear blue-shift ranging from 0.5 to 2% depending on the pressure of the liq. (solid) He. The .sum.-.sum. transitions of metal dimers studied so far show absorption and emission bands close to those in free space. Possible applications are discussed. A review with 40 refs.

L7 ANSWER 32 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:79399 CAPLUS

DOCUMENT NUMBER: 126:105442

TITLE: "High-pressure investigations on the solubility of synthetic and natural dyestuffs in supercritical gases by VIS-spectroscopy up to 180 MPa"

AUTHOR(S): *Schneider, Gerhard M.; Kautz, Cornelia B.; Tuma, Dirk*

CORPORATE SOURCE: Lehrstuhl für Physikalische Chemie II, Ruhr-Universität Bochum, Bochum, D-44780, Germany

SOURCE: **Process Technology Proceedings (1996), 12(High Pressure Chemical Engineering), 259-264**

CODEN: PTPREM; ISSN: 0921-8610

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB In this paper soly. measurements of synthetic and natural dyes are presented using visible spectroscopy. .beta.-Carotene was measured as a function of temp. and pressure in near- and supercrit. CO<sub>2</sub> (289-309 K, 10-160 Mpa) and CClF<sub>3</sub> (297-326 K, 12-180 MPa) using a static method. Addnl., the solubilities of 1,4-bis(alkylamino)-9,10-anthraquinones (with alkyl = Bu, octyl) were detd. with a dynamic method in temp. and

pressure ranges 310-340 K and 8-20 MPa, resp.; this method permits a continuous purifn. from more sol. impurities as well as the measurement of solubilities at the same time. For both anthraquinone dyes intersection points of the soly. isotherms were found in the plot of concn. vs. pressure. This behavior can be explained by a d. effect.

L7 ANSWER 33 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:46457 CAPLUS

DOCUMENT NUMBER: 126:123319

TITLE: Nuclear spin polarization in heavy-ion reactions

AUTHOR(S): Takahashi, Noriaki

CORPORATE SOURCE: Fac. Sci., Osaka Univ., Toyonaka, 560, Japan

SOURCE: Nuclear Reaction Dynamics of Nucleon-Hadron Many Body System: From Nuclear Spins & Mesons in Nuclei to Quark Lepton Nuclear Physics, Proceedings of the RCNP Osaka International Symposium, 14th, Osaka, Dec. 6-9, 1995 (1996), Meeting Date 1995, 54-58. Editor(s): Ejiri, Hiroyasu. World Scientific: Singapore, Singapore.

CODEN: 63UAAR

DOCUMENT TYPE: Conference; General Review

LANGUAGE: English

AB Studies of polarization phenomena in heavy-ion reactions at RCNP will be reviewed. Among other things polarization has been recently found for reaction products  $^{12}\text{B}$  from  $^{14}\text{N} + ^9\text{Be}$  at 38 MeV/u. As an example of utilization of polarization for spectroscopic purposes, a novel expt. is introduced; the study of nuclear and condensed-matter physics with use of snowballs, microclusters created around impurity ions is superfluid helium. Nuclear polarization is maintained throughout the lifetime in such impurity ions,  $^{12}\text{B}$ , as encapsulated in snowballs. 15 Refs.

L7 ANSWER 34 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1996:698920 CAPLUS

DOCUMENT NUMBER: 126:38962

TITLE: "Optical spectroscopy of atoms in superfluid helium"

AUTHOR(S): Foerste, M.; Gabrysch, M.; Guenther, H.; Kunze, M.; Layer, K.; Zu Putlitz, G.; Von Stein, U.; Riediger, O.; Tabbert, B.; Zuehlke, C.

CORPORATE SOURCE: Physikalisches Institut, Universitat Heidelberg, Heidelberg, D-69120, Germany

SOURCE: **Czechoslovak Journal of Physics (1996), 46(Suppl., Pt. S1, Proceedings of the 21st International Conference on Low Temperature Physics, 1996, Part S1), 367-368**

CODEN: CZYPAO; ISSN: 0011-4626

PUBLISHER: Institute of Physics, Academy of Sciences of the Czech Republic

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Optical spectroscopy of impurity atoms and ions immersed into liq. He can contribute to the understanding of the structure of defects in He and their interaction with the superfluid phase as well. Since the theor. understanding of the defect structure in liq. He caused by alkali impurities is incomplete so far, spectroscopic studies of these elements in the liq. He environment are of considerable interest. In this contribution

measurements of the spectra of the heavy alkali elements in superfluid He are presented. The position and the shape of excitation and emission lines of Rb is detd. using a tunable diode laser.

L7 ANSWER 35 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1996:418967 CAPLUS

DOCUMENT NUMBER: 125:96432

TITLE: 'Laser spectroscopy of impurity atoms in superfluid helium'

AUTHOR(S): *Foerste, M.; Guenther, H.; Layer, K.; zu Putlitz, G.; Schumacher, T.; Tabbert, B.*

CORPORATE SOURCE: Physikalisches Institut, Universitat Heidelberg, Heidelberg, D-69120, Germany

SOURCE: **Laser Spectroscopy, International Conference, 12th, Capri, Italy, June 11-16, 1995 (1996), Meeting Date 1995, 386-387. Editor(s): Inguscio, Massimo; Allegrini, Maria; Sasso, Antonio. World Scientific: Singapore, Singapore.**

CODEN: 63AIAJ

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The emission and absorption spectra of foreign atoms implanted into superfluid helium have been recorded. By detg. the line shifts and line broadenings compared to the free atom case, the influence of the surrounding liq. environment on the impurity particles is investigated. Recent spectroscopic results for magnesium and calcium are reported. The lowest triplet p-states of these elements turn out to be strongly affected by the helium matrix, since the absorption lines in the triplet system are much more shifted than transitions in the singlet system. Measurements of the lifetime of the 3s3p3Pj-states of magnesium confirm this observation, showing an unusual long decay const. for the intercombination transition to the 1S0 ground state compared to the Mg atom in vacuum.

L7 ANSWER 37 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1995:871309 CAPLUS

DOCUMENT NUMBER: 124:18873

TITLE: 'Interaction between charge carriers and foreign atoms in superfluid helium. From bound states to unusual transport'

AUTHOR(S): *Bashkin, Eugene P.*

CORPORATE SOURCE: Fachbereich Physik, Philipps-Univ. Marburg, Marburg, D-35032, Germany

SOURCE: **Zeitschrift fuer Physik B: Condensed Matter (1995), 98(3), 439-41**

CODEN: ZPCMDN; ISSN: 0722-3277

PUBLISHER: Springer

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A small amt. of impurities drastically affected the properties of charge carriers in superfluid 4He. Under certain conditions the effective interaction between the carrier and foreign atom turns out to be attractive at large distances. This may result in a localization of the impurity on the elec. charge in superfluid 4He. The attraction causes a significant increase in the concn. of foreign atoms near the carrier (the impurity cloud) and produces

around the charge a macroscopic region of radius 50-70 Å. rich with the impurity component. 2D bound states of an electron or ion near the free surface of liq. <sup>4</sup>He and a <sup>3</sup>He surface impurity were considered. This effect can strongly influence the motion of the charge carriers in xy-plane, which can be studied in expts. on the mobility. Photoelec. absorption of radiation due to the decay of the bound state as well as tunnelling ionization in a static elec. field are discussed. An extra scattering channel due to the interaction between an impurity and the hydrodynamic back-flow around the moving snowball or bubble is described. Within the velocity range of 1-60ms/s this scattering process becomes predominant and detcs. the mobility of charged particles in superfluid <sup>4</sup>He.

L7 ANSWER 38 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1995:694265 CAPLUS

DOCUMENT NUMBER: 123:305675

TITLE: SFC/NMR online coupling

AUTHOR(S): Albert, Klaus; Braumann, Ulrich

CORPORATE SOURCE: INSTITUT FUR ORGANISCHE CHEMIE, Tuebingen, D-72076, Germany

SOURCE: Special Publication - Royal Society of Chemistry (1995), 163(Frontiers in Analytical Spectroscopy), 86-93

CODEN: SROCDO; ISSN: 0260-6291

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The direct coupling of supercrit. fluid chromatog. and <sup>1</sup>H NMR spectroscopy is feasible. The advantage of NMR detection in the supercrit. state is the absence of <sup>1</sup>H NMR signals of solvents and impurities, the drawbacks of this hyphenated technique are the pressure dependence of NMR signals and the increased spin lattice relaxation times. Despite these problems the spectral quality obtained together with the capability to acquire 2-dimensional NMR spectra may bring SFC-NMR-coupling to an established hyphenated technique. Also the enormous application power of supercrit. fluid extn. in combination with <sup>1</sup>H NMR detection will lead to new structural elucidation pathways in the search for new, natural occurring compds. which may be used in medical therapy.

L7 ANSWER 39 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1994:608444 CAPLUS

DOCUMENT NUMBER: 121:208444

TITLE: A new process for the production of high purity carbon monoxide and hydrogen

AUTHOR(S): Kumar, R.; Kratz, W. C.; Guro, D. E.; Golden, T. C.

CORPORATE SOURCE: Air Products and Chemicals, Inc., Allentown, PA, 18195-1501, USA

SOURCE: Process Technology Proceedings (1994), 11(SEPARATION TECHNOLOGY), 383-402

CODEN: PTPREM; ISSN: 0921-8610

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An all-adsorption process for the sepn. and purifn. of both H and CO from steam CH<sub>4</sub> reformer (SMR) off-gas was developed. This process uses a new adsorbent which selectively adsorbs CO over all the other impurities including CO<sub>2</sub> from a typical SMR off-gas. The process employs two trains of four columns each: the first train produces high-purity CO at ambient pressure and the second train produces high-purity H at feed pressure. This process called GEMINI HYCO VSA was tested using a proprietary adsorbent. A comparison of performance, investment cost, utility requirements, and product CO cost relative to the current cryogenic technol. shows that the required capital investment is 32% lower for the integrated adsorption-SMR case than for the absorption-cryogenic technol.

L7 ANSWER 40 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1994:564194 CAPLUS

DOCUMENT NUMBER: 121:164194

TITLE: "Investigation of impurities in superfluid helium by optical spectroscopy"

AUTHOR(S): *Tabbert, Bernd; Beau, Michael R.; Fischer, Jorg; zu Puttlitz, Gisbert; Schreck, Holger*

CORPORATE SOURCE: Phys. Inst., Univ. Heidelberg, Heidelberg, W-6900, Germany

SOURCE: **Physica B: Condensed Matter (Amsterdam, Netherlands) (1994), 194-196, 731-2**

CODEN: PHYBE3; ISSN: 0921-4526

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The implantation of impurity ions in liq. <sup>4</sup>Helium leads to the formation of pointlike defects in the quantum fluid. Optical spectroscopy contributes to the understanding of the structure of these defects and of the interaction with the superfluid phase as well. Recent exptl. work was concd. on the spectra of alk. earth ions which show radiative transitions in contrast to the alkali elements investigated in earlier expts.

L7 ANSWER 43 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1994:224018 CAPLUS

DOCUMENT NUMBER: 120:224018

TITLE: Determination of trace amounts of impurities in molybdenum by spark source and glow discharge mass spectrometry

AUTHOR(S): Saito, Morimasa

CORPORATE SOURCE: Natl. Res. Inst. Met., Tokyo, Japan

SOURCE: *Nippon Kinzoku Gakkaishi* (1994), 58(2), 188-93

CODEN: NIKGAV; ISSN: 0021-4876

DOCUMENT TYPE: Journal

LANGUAGE: Japanese

AB For the detn. of trace and ultra-trace amts. of impurities in high-purity molybdenum, spark source mass spectrometry and glow discharge mass spectrometry were studied. In spark source mass spectrometry using the metal probe method, the liq.-helium cryogenic pump was used to protect the surface of the samples from oxidn. The theor. relative sensitivity factors (Mo = 1) calcd. from phys. properties were used. The anal. results



obtained for molybdenum tablet and high-purity molybdenum were in good agreement with those obtained by other methods (at. absorption spectrometry and others). In glow discharge mass spectrometry, the relative sensitivity factors were calcd. by using the results obtained by spark source mass spectrometry and at. absorption spectrometry, and this method was applied to the detn. of ultra-trace amts. in ultra high-purity molybdenum and gave the satisfactory results. The detection limits (2.sigma., n = 10) in the integration time of 600 s for U and Th were 0.6 ppb and 0.3 ppb, and the values for Al, Si, Cr, Mn and Cu were in the range of 10 ppb to 0.5 ppb.

L7 ANSWER 44 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1994:181896 CAPLUS

DOCUMENT NUMBER: 120:181896

TITLE: "IR spectroscopy and analysis of the impurity composition of individual xenon fluorides in liquid noble gas solutions"

AUTHOR(S): *Nabiev, Sh. Sh.; Khodzhiev, B. S.*

CORPORATE SOURCE: Kurchatov. Inst., Moscow, Russia

SOURCE: *Vysokochistye Veshchestva* (1993), (5), 111-20

CODEN: VYVEEC; ISSN: 0235-0122

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The IR spectra of XeFn (n = 2, 4, 6) mols. liquefied xenon and krypton solns. were studied. The frequencies, half-width and intensities of XeFn vibrational bands as well as some anharmonicity consts. of these mols. were detd. With increasing XeF6 concn. in the liq. krypton (.gtoreq.1.5 .times. 10<sup>-4</sup> mol/L) and xenon (.gtoreq.4 .times. 10<sup>-4</sup> mol/L) solns. (XeF6)<sub>n</sub> polymers are produced. Polymn. of XeF6 in the liquefied xenon and krypton solns. is accompanied by increase in the structural rigidity of xenon hexafluoride mols. IR spectroscopy of cryogenic solns. can be used for detn. of XeFn impurities in individual xenon fluorides.

L7 ANSWER 45 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1994:21229 CAPLUS

DOCUMENT NUMBER: 120:21229

TITLE: Semi-self-maintained glow discharge in a mixture carbon monoxide and nitrogen at cryogenic temperatures

AUTHOR(S): *Azharonok, V. V.; Gurashvili, V. A.; Kiz'min, V. N.; Turkin, N. G.; Filatova, I. I.; Chubrik, N. L.; Shimanovich, V. D.*

CORPORATE SOURCE: Inst. Mol. At. Kiz., Belarus

SOURCE: *Fizika Plazmy* (Moscow, Russian Federation) (1993), 19(7), 903-9

CODEN: FIPLDK; ISSN: 0134-5052

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB Emission spectroscopy was used to study non-self-maintained fast TEA discharge in a CO-N<sub>2</sub> cryogenic mixt. The gas temps. were detd. from N<sub>2</sub> and N<sub>2</sub><sup>+</sup> spectra. The relaxation is discussed in terms of mol. collision reactions. The effective electron-ion recombination coeff. is detd. along with the capture of electrons by electroneg. mol. impurities at gas temps. of 120 K.

L7 ANSWER 46 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1993:685220 CAPLUS

DOCUMENT NUMBER: 119:285220

TITLE: Consideration of the chemical reactivity of trace impurities present in a glow discharge

AUTHOR(S): Ohorodnik, S. K.; DeGendt, S.; Tong, S. L.; Harrison, Willard W.

CORPORATE SOURCE: Dep. Chem., Univ. Florida, Gainesville, FL, 32611, USA

SOURCE: Journal of Analytical Atomic Spectrometry (1993), 8(6), 859-65

CODEN: JASPE2; ISSN: 0267-9477

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Optical and mass spectrometric diagnostics were applied in a study of the chem. reactivity of the plasma impurity species in an r.f. glow discharge source. Copper, Fe and Ta metals and Ta powder-based compacted disks were chosen as test cathodes. A cryogenic coil incorporated within the discharge source was used in the investigations of the potential interactions. Significant increases were obsd. in the sputtering gas and cathode matrix ion signals, as well as the ground- and excited-state populations of these species with cryogenic cooling. The relative reactivities of the matrix-element species with water-related species in the plasma and the significance for glow discharge-based anal. techniques are discussed.

L7 ANSWER 47 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1993:634335 CAPLUS

DOCUMENT NUMBER: 119:234335

TITLE: "Spectroscopy of alkali atoms and molecules in superfluid helium"

AUTHOR(S): *Takahashi, Y.; Sano, K.; Kinoshita, T.; Yabuzaki, T.*

CORPORATE SOURCE: Fac. Sci., Kyoto Univ., Kyoto, 606-01, Japan

SOURCE: **Physical Review Letters** (1993), 71(7), 1035-8

CODEN: PRLTAO; ISSN: 0031-9007

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors report on the first laser spectroscopy of alkali atoms (Cs and Rb) and mols. (Na<sub>2</sub> and Li<sub>2</sub>) in superfluid helium. General features of the obsd. spectra can be explained in terms of the spherical at. bubble model. The excitation and emission spectra for the D<sub>2</sub> lines, however, have double peaked profiles, indicating the importance of the nonspherical d. distribution of surrounding helium atoms. The emission spectra for the mols. show well-resolved vibrational structures in the electronic ground states.

L7 ANSWER 48 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1993:569463 CAPLUS

DOCUMENT NUMBER: 119:169463

TITLE: "Vibrational spectra of phosphine of various degrees of purity in a solution of liquid argon"

AUTHOR(S): *Kondaurov, V. A.; Melikova, S. M.; Nabiev, Sh. Sh.; Sennikov, P. G.;*

*Raldugin, D. A.; Shchepkin, D. N.*

CORPORATE SOURCE: Ross. Nauchn. Tsentr "Kurchatovskii Inst.", Moscow, Russia  
SOURCE: **Vysokochistye Veshchestva (1993), (3), 119-26**

CODEN: VYVEEC; ISSN: 0235-0122

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The method of cryogenic IR spectroscopy was used to study solns. in liq. Ar of phosphine samples with different degrees of purity. The change in the length of the optical path from 1 to 200 cm allowed one to study the overtones and fundamental bands to 3rd order, inclusively. In the IR spectra of samples of the initial phosphine, bands belonging to impurities of hydrocarbons, N<sub>2</sub>O, CO<sub>2</sub> and moisture were recorded.

L7 ANSWER 49 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1993:530487 CAPLUS

DOCUMENT NUMBER: 119:130487

TITLE: Cryogenic coil for glow discharge sources

AUTHOR(S): Ohorodnik, Susan K.; Harrison, Willard W.

CORPORATE SOURCE: Dep. Chem., Univ. Florida, Gainesville, FL, 32611, USA

SOURCE: **Analytical Chemistry (1993), 65(18), 2542-4**

CODEN: ANCHAM; ISSN: 0003-2700

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A method for removing water vapor and other gaseous impurities from the glow discharge source by phys. freezing out the impurities by means of a cryogenic cooling coil is described. The effectiveness of the cooling is demonstrated with an aluminum alloy sample using glow discharge mass spectrometry. Upon cooling, the interferences from water and other impurities occurring in the m/z range between 10 to 40, which can obscure the Al<sup>+</sup> and Mg<sup>+</sup> analyte ion signals, are no longer detected. The simplicity and adaptability of the cryogenic cooling coil are also discussed.

L7 ANSWER 51 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1992:563026 CAPLUS

DOCUMENT NUMBER: 117:163026

TITLE: "Monitoring of dopant and impurity concentrations in liquid argon by infrared spectroscopy"

AUTHOR(S): *Moulson, M.; Fabjan, C. W.; Lacarrere, D.; Seidl, W.; Vuillemin, V.*

CORPORATE SOURCE: CERN, Geneva, Switz.

SOURCE: **Nuclear Instruments & Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors, and Associated Equipment (1992), A320(1-2), 277-82**

CODEN: NIMAER; ISSN: 0168-9002

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors discuss applications and advantages of liq. phase IR spectroscopy as a technique for monitoring dopant and impurity concns. in liq. argon. The use of IR spectroscopy to detect contaminants in liq. argon is demonstrated. Gas and liq. phase spectra of ethylene and allene in argon are presented and compared. Absorption coeffs.

have been obtained for the principal peaks. The technique may be used to analyze a wide range of substances in cryogenic soln.

L7 ANSWER 52 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1992:499726 CAPLUS

DOCUMENT NUMBER: 117:99726

TITLE: Dye laser spectroscopy of isolated atoms and ions in liquid helium

AUTHOR(S): Zu Putlitz, G.; Beau, M. R.

CORPORATE SOURCE: Phys. Inst., Univ. Heidelberg, Heidelberg, W-6900/1, Germany

SOURCE: Topics in Applied Physics (1992), 70(Dye Lasers: 25 Years), 237-47

CODEN: TAPHD4; ISSN: 0303-4216

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review with 33 refs. Alk. earth atoms and ions in superfluid helium were investigated by means of dye laser spectroscopy. The obsd. line shifts and broadenings provide microscopic insight into the structure of such point defects. The results are compared with the data of low pressure shifts in gaseous helium extrapolated to liq. helium d., with reveals new effects due to the liq. environment. Moreover these impurities can be used as new tools for the investigation of the superfluid itself, for instance coloring of vortices or trapping in elec. and magnetic traps. These studies were only made possible by the unique properties of the dye laser, such as high spectral power d., wide range tunability and unsurpassed beam quality.

L7 ANSWER 53 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1992:461850 CAPLUS

DOCUMENT NUMBER: 117:61850

TITLE: Isotopic spectral analysis of inorganic gases

AUTHOR(S): Funtov, V. N.; Nemets, A. M.; Nemets, V. M.; Petrov, A. A.; Solovev, A. A.

CORPORATE SOURCE: Inst. Phys., St. Petersburg Univ., St. Petersburg, 198904, Russia

SOURCE: Analyst (Cambridge, United Kingdom) (1992), 117(6), 1049-54

CODEN: ANALAO; ISSN: 0003-2654

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The possibilities for isotopic spectral gas anal. are considered. The method is based on a combination of an isotope diln. method (with or without further physico-chem. transformation of the resulting anal. mixt.) and a spectroscopic measurement of the isotope compn. of the element to be detd. The transformation includes various processes of isotope balancing, their accumulation and isolation. Detection limits for instrumental techniques are 100 ppb-10 ppt and for the combined techniques 1 ppb-1 ppm. Calibration of the method does not require ref. gas samples based on the compn. of the analyzed gas.

L7 ANSWER 54 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1992:268235 CAPLUS

DOCUMENT NUMBER: 116:268235

TITLE: "Application of a cryospectroscopy method to study the molecular composition of gases"

AUTHOR(S): *Zhigula, L. A.; Kolomiitsova, T. D.; Kondaurov, V. A.; Melikova, S. M.; Shchepkin, D. N.*

CORPORATE SOURCE: Santkt-Peterburg Gos. Univ., St. Petersburg, USSR

SOURCE: **Zhurnal Prikladnoi Spektroskopii (1992), 56(3), 381-8**

CODEN: ZPSBAX; ISSN: 0514-7506

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB A cryogenic procedure was developed for the sensitive detn. of mol. microimpurities in pure and ultrapure gases. IR absorption spectra of liq. air, oxygen as well as of solns. of 20 different substances (hydrocarbons, freons etc.) in liq. argon were investigated. When using optical layers up to 2 m, the sensitivity of the procedure amts. to 10<sup>-8</sup>-10<sup>-4</sup> mol.% from the ground substance. Calibration tables for 27 characteristic impurities are presented.

L7 ANSWER 62 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1989:104145 CAPLUS

DOCUMENT NUMBER: 110:104145

TITLE: "Vibrational spectra of liquid high-purity silicon, germanium, sulfur, and selenium hydrides and their solutions in liquid krypton"

AUTHOR(S): *Devyatykh, G. G.; Sennikov, P. G.; Tokhadze, K. G.; Shkrinin, V. E.*

CORPORATE SOURCE: Inst. Khim., Gorkiy, USSR

SOURCE: **Vysokochistye Veshchestva (1988), (6), 21-8**

CODEN: VYVEEC; ISSN: 0235-0122

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The cryogenic IR absorption spectra were studied of liq. hydrides of Group IVA elements and Group VIA elements and their solns. (SiH<sub>4</sub>, GeH<sub>4</sub>, H<sub>2</sub>S, H<sub>2</sub>Se) in liq. Kr, while the principal attention was given to a study of the spectra in the little studied region of overtones and composite bands. These studies can serve as a basis for further study of associative equil. in pure liqs., phase equil., and the state of impurities in systems based on them.

L7 ANSWER 66 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1987:428495 CAPLUS

DOCUMENT NUMBER: 107:28495

TITLE: The kinetics of phonon-impurity system of superfluid helium-3-helium-4 solutions

AUTHOR(S): *Adamenko, I. N.; Rudavskii, E. Ya.*

CORPORATE SOURCE: Khar'k. Gos. Univ., Kharkov, USSR

SOURCE: **Fizika Nizkikh Temperatur (Kiev) (1987), 13(1), 3-32**

CODEN: FNTEDK; ISSN: 0132-6414

DOCUMENT TYPE: Journal; General Review

LANGUAGE: Russian

AB A review with 81 refs. on exptl. and theor. studies on elementary excitations and their interactions; transport properties (viscosity, diffusion, thermal cond.); and absorption and velocity of 1st and 2nd sound in superfluid  $^3\text{He}$ - $^4\text{He}$  solns.

L7 ANSWER 67 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1987:110911 CAPLUS

DOCUMENT NUMBER: 106:110911

TITLE: Helium-filled proportional counter for low-temperature operation (4.2-300 K) and its application to cryogenic resonance-electron Moessbauer spectroscopy

AUTHOR(S): Isozumi, Yasuhito; Kishimoto, Shunji; Katano, Rintaro; Takekoshi, Hidekuni

CORPORATE SOURCE: Radioisot. Res. Cent., Kyoto Univ., Kyoto, Japan

SOURCE: Review of Scientific Instruments (1987), 58(2), 293-8

CODEN: RSINAK; ISSN: 0034-6748

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The operation of a proportional counter filled with He gas was investigated at low temps. down to 5 K. A He-filled counter cooled at temps. below 30 K works well in the proportional region, but with low gas gains (ltoreq.100). The operation at low temps. (ltoreq.30 K) is attributed to the complete removal of impurities from He gas as well as the extreme depression of the reaction frequency of metastable He. The absence of impurities results in eliminating the Penning effect, i.e., an ionization process of impurity atoms or mols. by collisions with metastable He, which spreads electron avalanches in both space and time if He gas contains a slight amt. of impurities (1-103 ppm). Continuous discharges caused by the photoeffect of UV photons, which are mostly produced in decay channels of metastable He are thermally quenched at low temps. below 30 K. The He-filled counter provides a new method to detect nuclear radiations at very low temps. The present counter technique has been successfully applied to the resonance-electron Moessbauer spectroscopy near liq.-He temp. (.apprx.5 K).

L7 ANSWER 68 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1986:468672 CAPLUS

DOCUMENT NUMBER: 105:68672

TITLE: Transport efficiency of free atoms for laser spectroscopy using a cryogenic helium jet

AUTHOR(S): Martin, A. G.; Dutta, S. B.; Rogers, W. F.; Clark, D. L.

CORPORATE SOURCE: Nucl. Struct. Res. Lab., Univ. Rochester, Rochester, NY, 14627, USA

SOURCE: Nuclear Instruments & Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors, and Associated Equipment (1986), A247(3), 520-4

CODEN: NIMAER; ISSN: 0168-9002

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A cryogenic He jet system using pure He was developed to thermalize and transport nuclear reaction products to a laser spectroscopy chamber for isotope shift and hyperfine

structure measurements. The transport properties of the He jet were studied by using  $^{126}\text{Ba}$  ( $T_{1/2} = 100$  min) produced by an 80-MeV  $^{12}\text{C}$  beam impinging on natural Sn targets. High transport efficiency (20-40%) of the reaction products in ultrapure He was achieved, but was sensitive to minute amts. of impurities. It has not been possible to transport Ba in elemental form, making laser spectroscopic measurements on free atoms impossible. An explanation to the problem is suggested.

L7 ANSWER 69 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1986:116675 CAPLUS

DOCUMENT NUMBER: 104:116675

TITLE: Application of low temperature desorption in systems for adsorptive purification of cryogenic gases

AUTHOR(S): Leyarovski, E.; Georgiev, Ya.; Zakhariev, A.

CORPORATE SOURCE: Dep. Magn. Low Temp., G. Nadzhakov Inst. Solid State Phys., Sofia, 1184, Bulg.

SOURCE: Cryogenics (1986), 26(1), 29-32

CODEN: CRYOAX; ISSN: 0011-2275

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The application of low-temp. desorption and reactivation of the adsorbent in adsorptive systems for the purifn. of cryogenic gases from gas impurities is considered. The degree of purifn. obtained by using low-temp. desorption is evaluated. Expts. for the detn. of the rate and the degree of desorption of N and H on charcoal at 77.4 K were carried out. Practical schemes for purifn. of gases by using low-temp. desorption of the main part of the adsorbed substances are proposed.

L7 ANSWER 70 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1985:226179 CAPLUS

DOCUMENT NUMBER: 102:226179

TITLE: Phonon and impurity absorption of sound in dilute helium-3/helium-4 solutions below 0.5 K

AUTHOR(S): Chagovets, V. K.; Rudavskii, E. Ya.; Goncharov, V. A.

CORPORATE SOURCE: Fiz.-Tekh. Inst. Nizk. Temp., Kharkov, USSR

SOURCE: Fizika Nizkikh Temperatur (Kiev) (1985), 11(3), 266-71

CODEN: FNTEDK; ISSN: 0132-6414

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB The sound absorption,  $\alpha$ , and dissipative processes in  $^4\text{He}$  and  $^3\text{He}$ - $^4\text{He}$  dil. soln. contg. 1.5 times.  $10^{-3}$   $^3\text{He}$  were studied at 40-400 mK and 30-50 MHz by a coherent pulse technique. For  $^4\text{He}$ , the temp. dependence of  $\alpha$  is well described by a 3-phonon process, while for the dil. soln. by both a viscous relaxation and a new phonon-impurity relaxation process. The dil. soln. retains the anomalous phonon dispersion as that in  $^4\text{He}$ .

L7 ANSWER 71 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1984:594496 CAPLUS

DOCUMENT NUMBER: 101:194496  
TITLE: Adsorption methods for the purification of air and the products of air fractionation  
AUTHOR(S): Vagin, E. V.; Petukhov, S. S.  
CORPORATE SOURCE: USSR  
SOURCE: Khimicheskoe i Neftyanoe Mashinostroenie (1984), (7), 18-20  
CODEN: KHNMAO; ISSN: 0023-1126  
DOCUMENT TYPE: Journal; General Review  
LANGUAGE: Russian  
AB A review, with 9 refs., is given on the use of adsorption and combined condensation-adsorption methods for the removal of oil vapors, CO<sub>2</sub>, H<sub>2</sub>O, and other impurities from air and cryogenic air fractionation products.

L7 ANSWER 73 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 1983:62523 CAPLUS  
DOCUMENT NUMBER: 98:62523  
TITLE: Spectroscopic studies of pyrazine in cryogenic solutions  
AUTHOR(S): Lee, J.; Li, F.; Bernstein, E. R.  
CORPORATE SOURCE: Dep. Chem., Colorado State Univ., Fort Collins, CO, 80523, USA  
SOURCE: Journal of Physical Chemistry (1983), 87(2), 260-5  
CODEN: JPCHAX; ISSN: 0022-3654  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The 1st excited singlet (1B<sub>3u</sub>) and triplet (3B<sub>3u</sub>) states of pyrazine are studied in the cryogenic liqs. CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>H<sub>10</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>6</sub>, and 1-C<sub>4</sub>H<sub>8</sub>. The reported data include 1B<sub>3u</sub> .tautm. 1A<sub>1g</sub> absorption, fluorescence, and lifetimes and 3B<sub>3u</sub> .fwdarw. 1A<sub>1g</sub> phosphorescence and lifetimes as a function of temp. and concn. From the behavior of the 1B<sub>3u</sub> .tautm. 1A<sub>1g</sub> system H bonding is an important feature of the intramol. potential in these solns. The lifetime of the singlet state is quite short with an upper limit of .apprx.5 ns. The 3B<sub>3u</sub> .fwdarw. 1A<sub>1g</sub> phosphorescence has a measured 4-ms lifetime at 90 K which is consistent with an impurity quenching mechanism and impurity concn. of 0.01 ppm. It was possible to sep. out radiative, nonradiative, and impurity quenching rate consts. in these systems for the 3B<sub>3u</sub> state of pyrazine. An activation energy for the temp.-dependent radiationless process of .apprx.2 kcal/mol is regarded as the H-bonding energy between solvent and pyrazine (N..HC) in the excited 3B<sub>3u</sub> state.

L7 ANSWER 74 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 1983:25039 CAPLUS  
DOCUMENT NUMBER: 98:25039  
TITLE: Spectroscopic studies of pyrazine in cryogenic solutions  
AUTHOR(S): Lee, J.; Li, F.; Bernstein, E. R.  
CORPORATE SOURCE: Dep. Chem., Colorado State Univ., Fort Collins, CO, USA  
SOURCE: Report (1982), TR-7; Order No. AD-A116780, 37 pp. Avail.: NTIS From: Gov. Rep. Announce. Index (U. S.) 1982, 82(23), 4841



DOCUMENT TYPE: Report

LANGUAGE: English

AB The differences between the n.pi. transition of pyrazine and the  $\pi$ - $\pi$  transition of naphthalene and benzene used as probes for the structure and dynamics of cryogenic solns. are discussed in terms of H bonding (-N...H-C). Four main points can be made based on the above spectroscopic studies. First, the addn. off H bonding to the pyrazine/solvent interaction causes changes of the intermol. potential as a function off temp. Thus, the fluorescence spectra are shifted to higher energy as temp. increases. Secondly, H bonding in the excited state tends to reduce the nonradiative processes and results in an activation energy for radiationless decay of roughly 2 kcal/mol for the 3B3u state. Thirdly, solvent effects on the ground state and the 3B3u state are quite similar. Fourthly, in these cryogenic solvents the triplet state lifetime is greatly influenced by an impurity quenching process. It was possible to sep. this rate from the intramol. radiative and nonradiative rates and to arrive at an impurity concn. est. of 0.01 ppm in C2H6. The lifetime measured for the phosphorescence under these conditions is 4 ms which is within a factor of 4 of the longest lifetime measured for this system in a rigid glass.

L7 ANSWER 75 OF 88 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1982:132936 CAPLUS

DOCUMENT NUMBER: 96:132936

TITLE: "Cryogenic techniques in infrared spectroscopy"

AUTHOR(S): *Kartha, S. B.; Kartha, V. B.; Soni, J. N.*

CORPORATE SOURCE: Bhabha At. Res. Cent., Bombay, 400 085, India

SOURCE: **Proc. Symp. Infrared Technol. Instrum. (1981), Meeting Date 1980, 429-35. India Dep. Atomic Energy: Bombay, India.**

CODEN: 47HTAP

DOCUMENT TYPE: Conference

LANGUAGE: English

AB Two low-temp. IR cells, one for low-temp. solid state studies and the other for low-temp. liq. phase studies were fabricated for studying IR spectra of cryogenic systems. The app. can be used to study conformational inversion, isotopic anal., and impurities in high-purity O2.

	Hits	Search Text
1	1	(cryogenic with (fluorocarbon\$3 or (fluorinat\$3 near3 hydrocarbon\$3))) and impurit\$3
2	73	cryogenic with (fluorocarbon\$3 or (fluorinat\$3 near3 hydrocarbon\$3))
3	192	cryogenic with (freon\$2 or fluorocarbon\$3 or (fluorinat\$3 near3 hydrocarbon\$3))
4	7	(cryogenic with (freon\$2 or fluorocarbon\$3 or (fluorinat\$3 near3 hydrocarbon\$3))) and (impurit\$3 or contaminat\$3)
5	260	freon\$2 with (impurit\$3 or contaminat\$4)
6	159	(freon\$2 with (impurit\$3 or contaminat\$4)) and (liquid or cryogen\$3)
7	28	(freon\$2 with (impurit\$3 or contaminat\$4)) with (liquid\$2 or cryogen\$3)
8	9060	(cryogenic or supercritical) and (impurit\$3 or contaminat\$3)
9	781	((cryogenic or supercritical) and (impurit\$3 or contaminat\$3)) and (IR or infra-red)
10	71	((((cryogenic or supercritical) and (impurit\$3 or contaminat\$3)) and (IR or infra-red)) and ((detect\$4 or determin\$4) with (impuriti\$4 or contaminat\$4))
11	4326	((250/343,352) or (436/164-167)).CCLS.
12	216	((((250/343,352) or (436/164-167)).CCLS.) and (cryogen\$3 or superfluid\$3 or supercritical)
13	8	(((((250/343,352) or (436/164-167)).CCLS.) and (cryogen\$3 or superfluid\$3 or supercritical)) and ((detect\$4 or determin\$4) with (impuriti\$4 or contaminat\$4))